

Fig. 1A

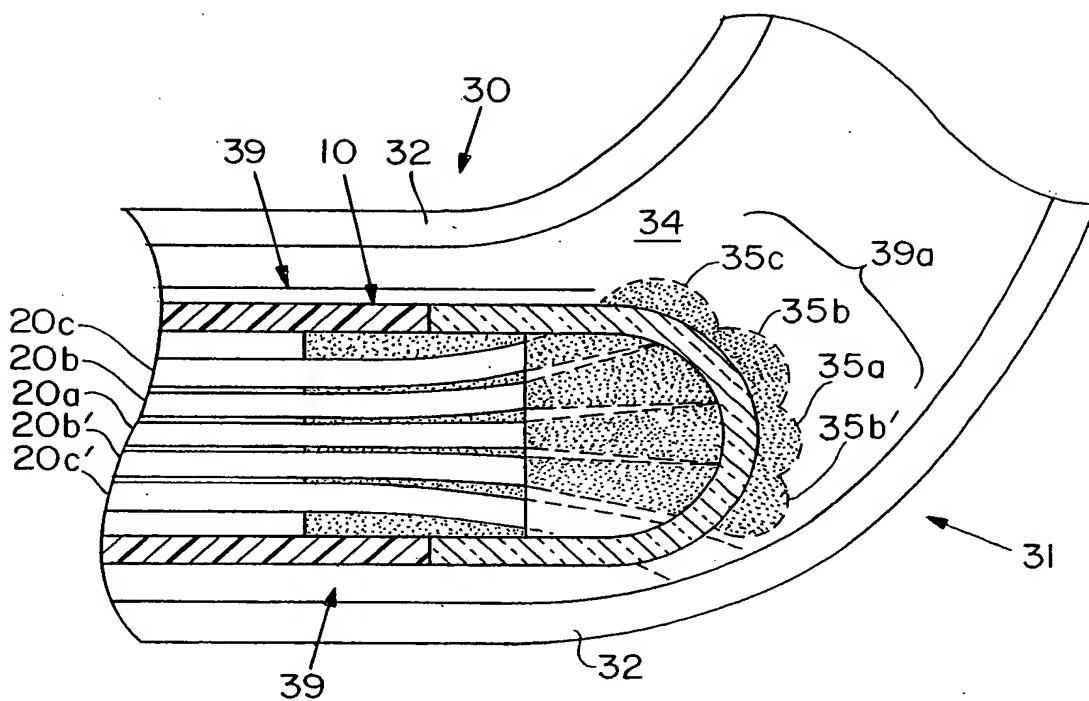


Fig. 1B

Docket No. 301505.1363-110  
Title: SYSTEMS AND METHODS OF  
MOLECULAR SPECTROSCOPY TO  
PROVIDE FOR THE DIAGNOSIS OF TISSUE  
Inventors: Rava et al.

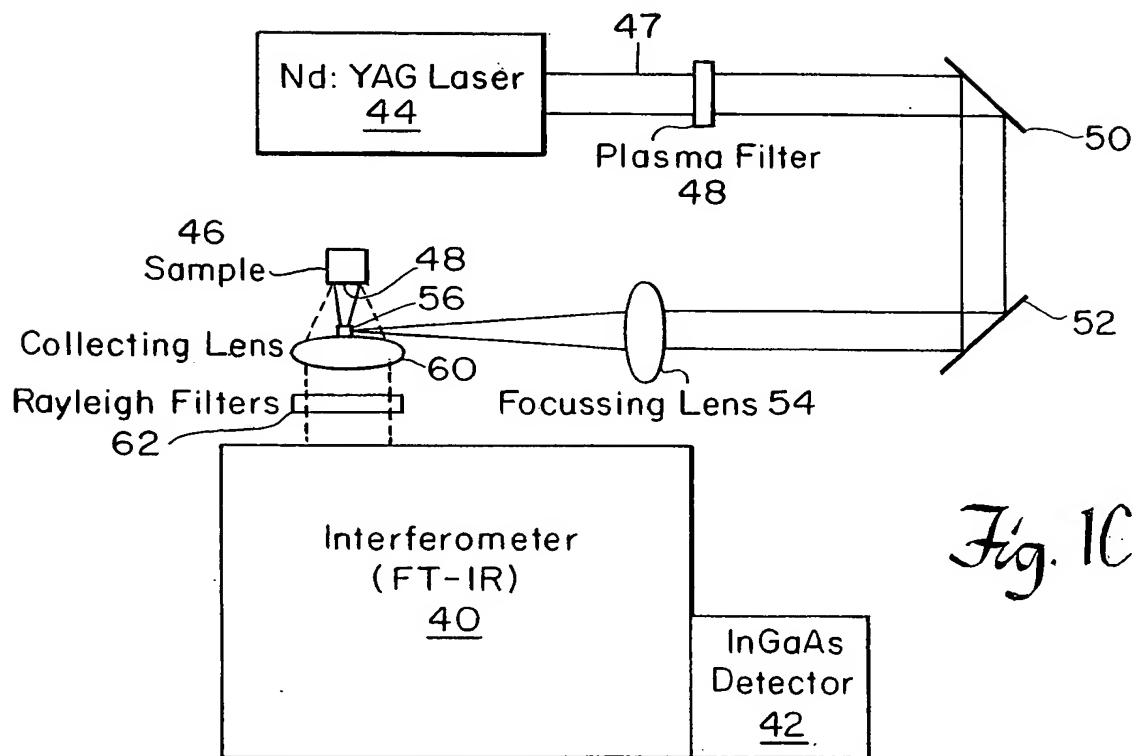


Fig. 1C

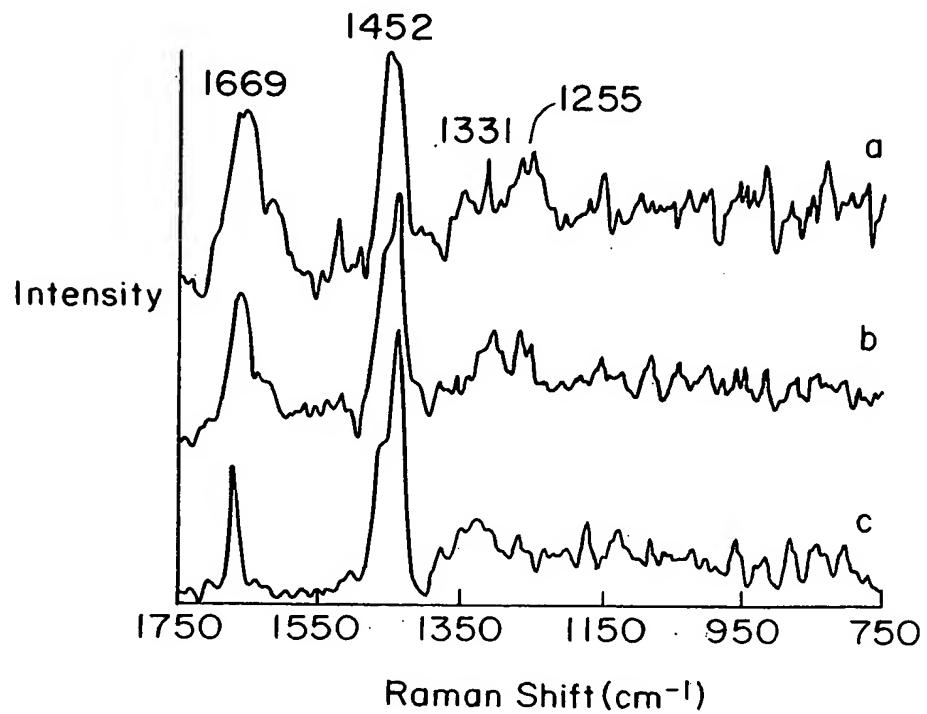


Fig. 2

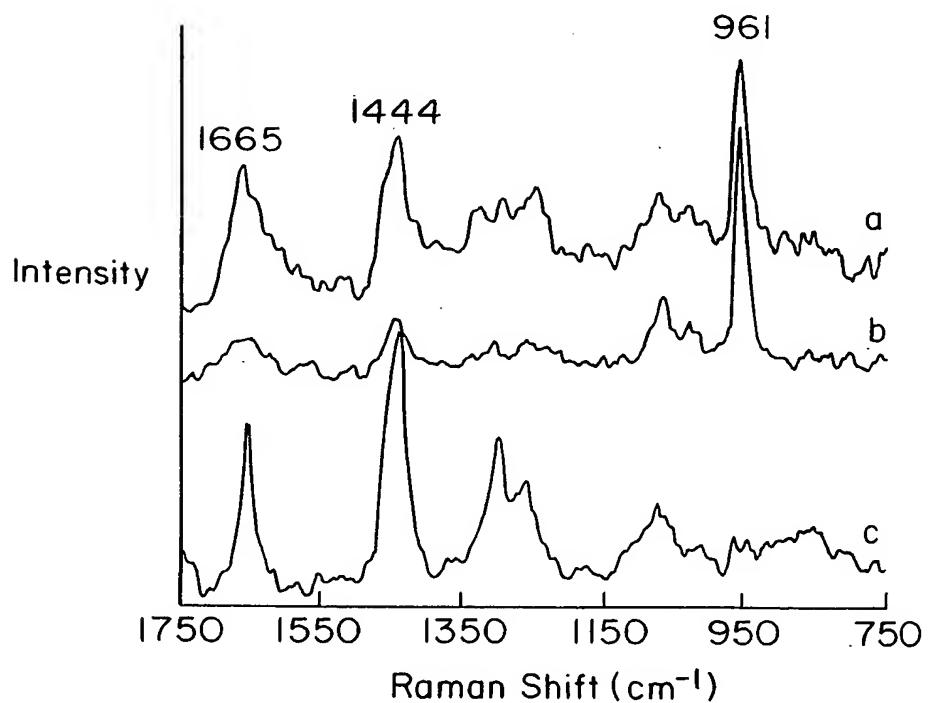


Fig. 5

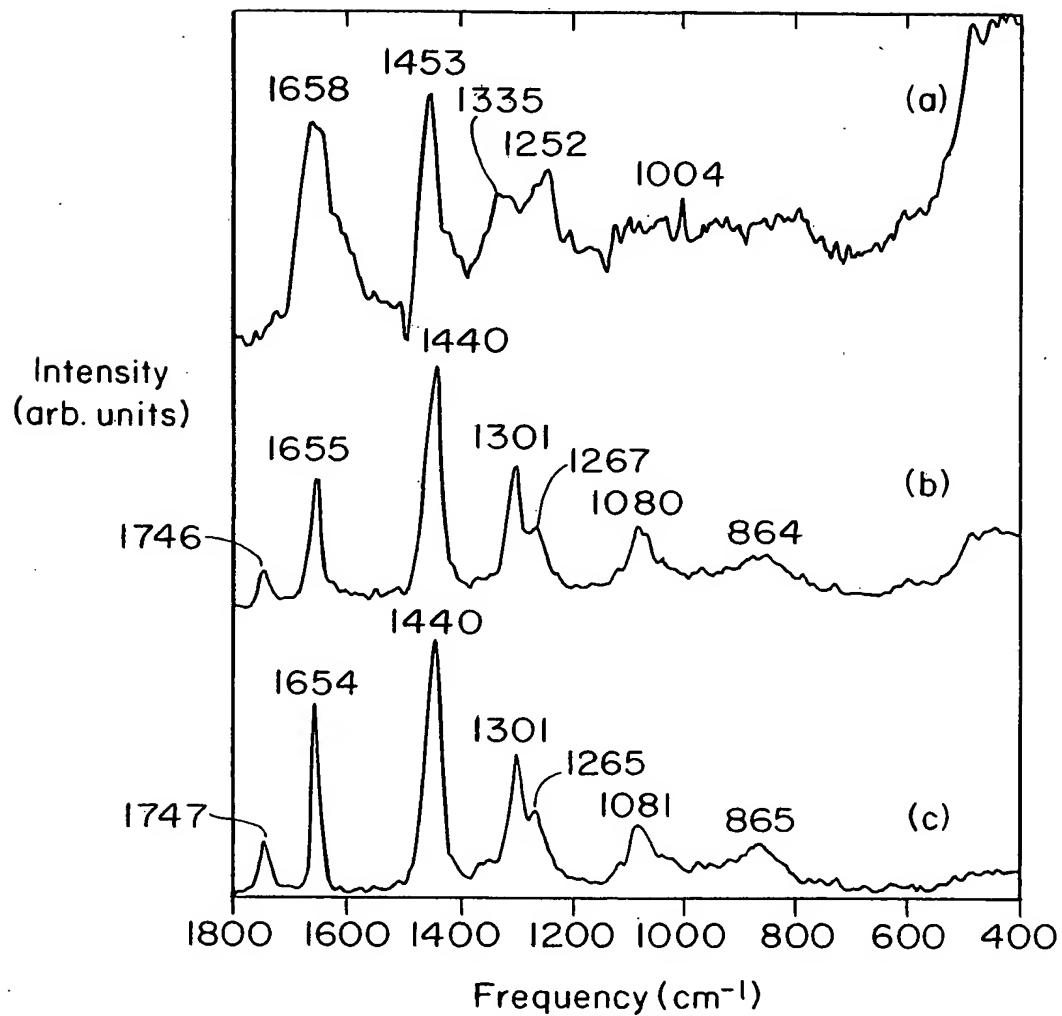


Fig. 3

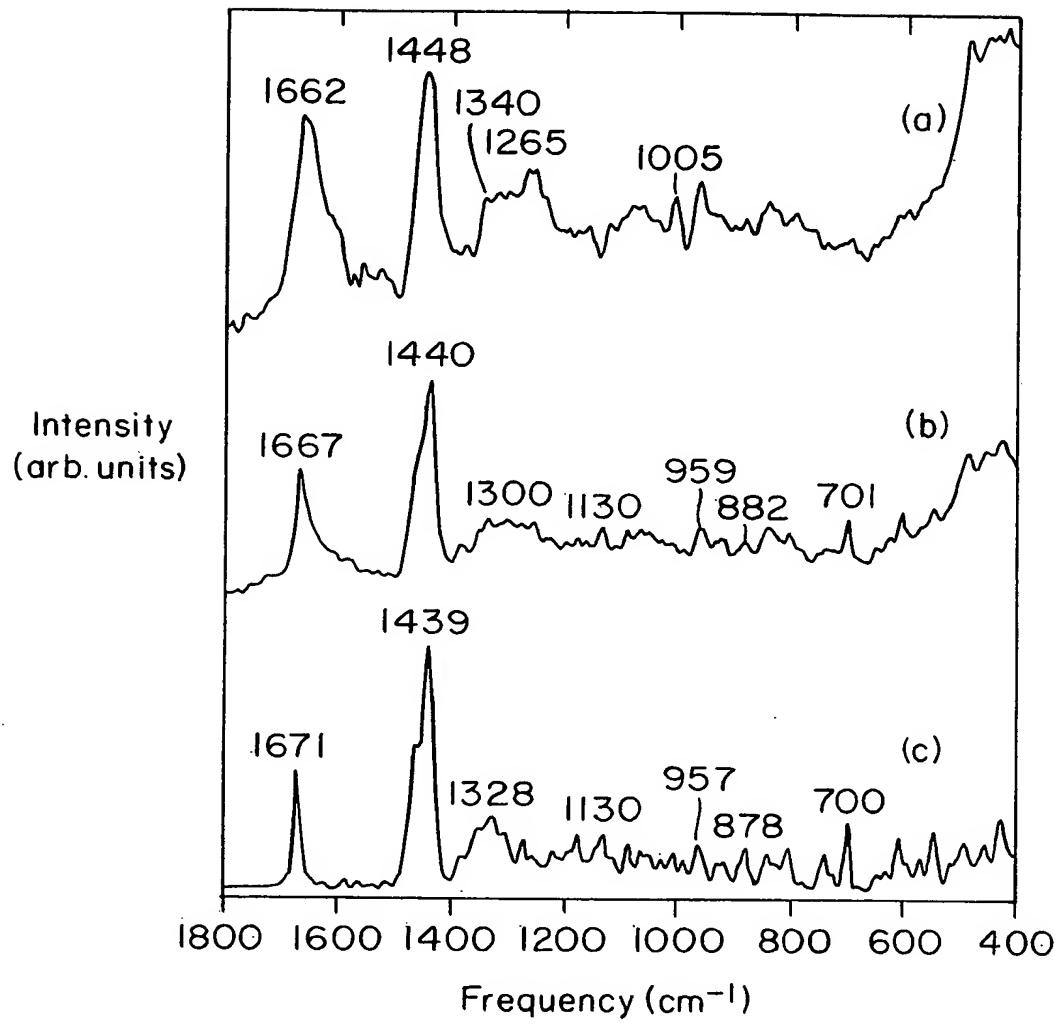


Fig. 4

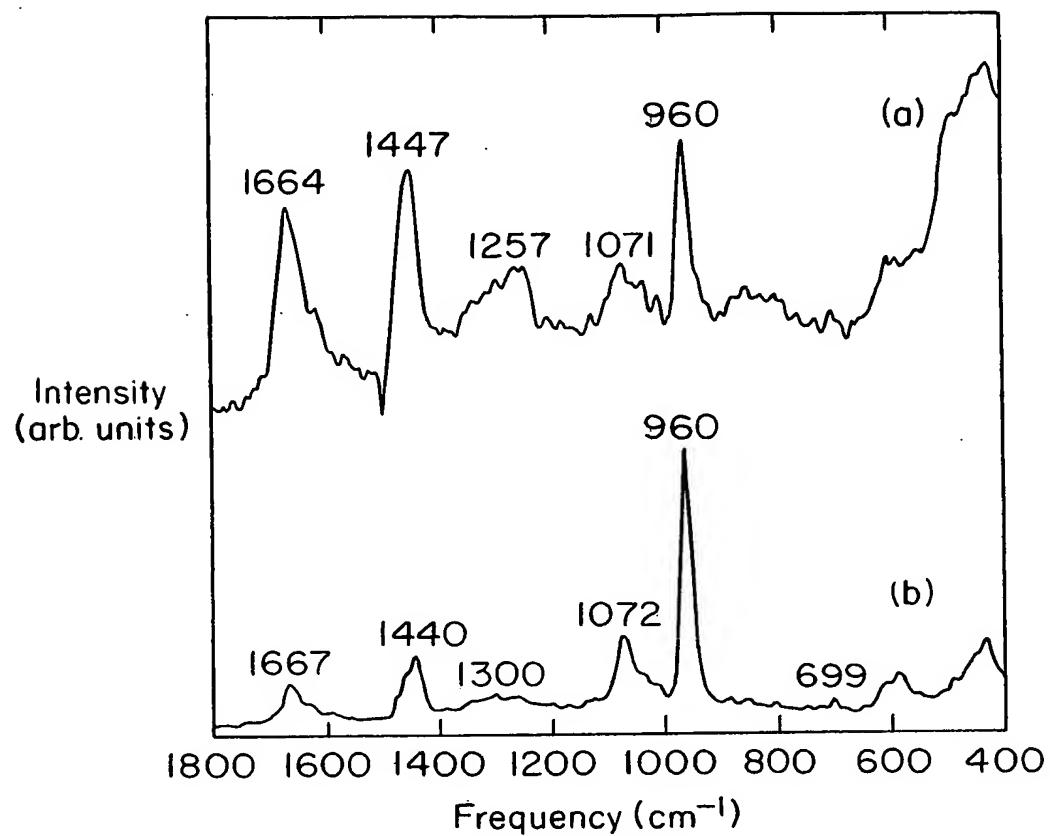


Fig. 6

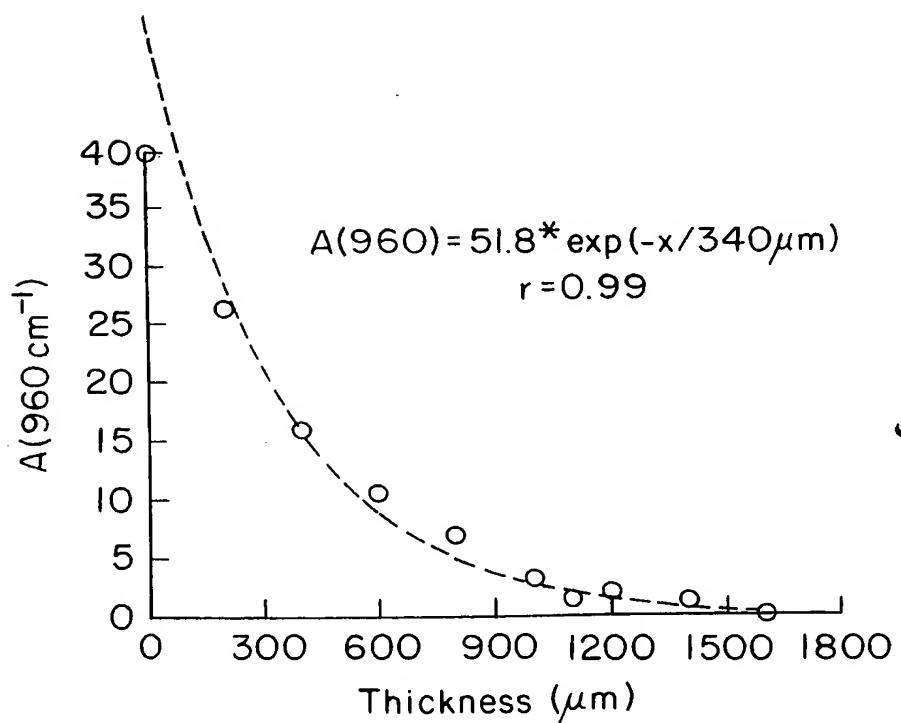


Fig. 7

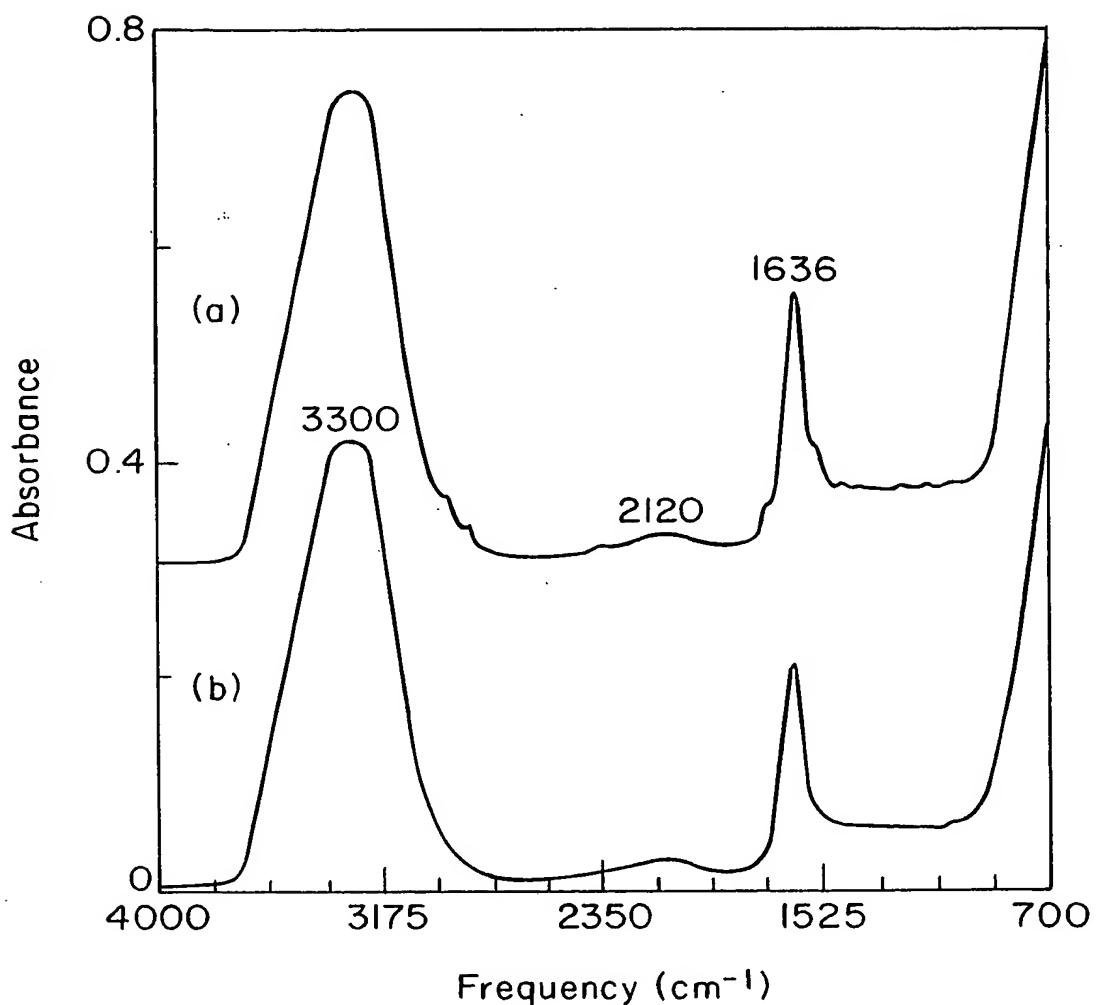


Fig. 8

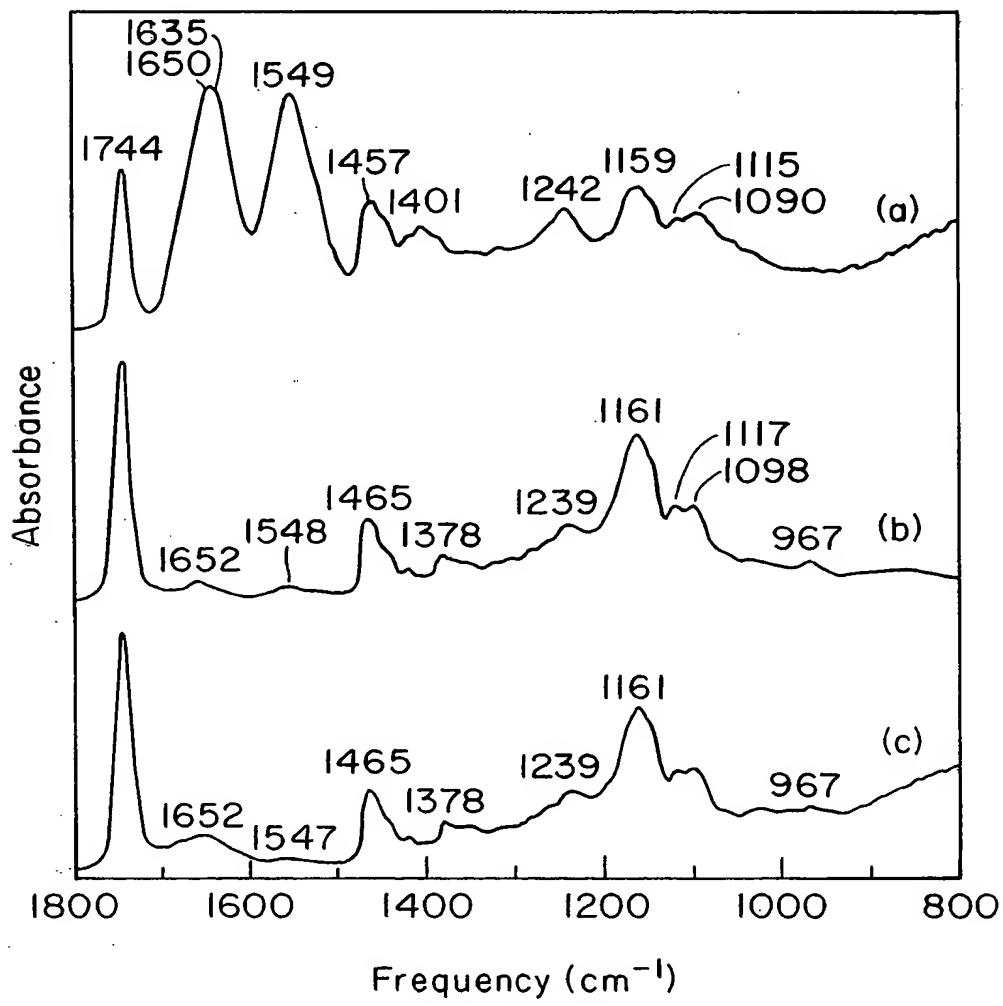


Fig. 9

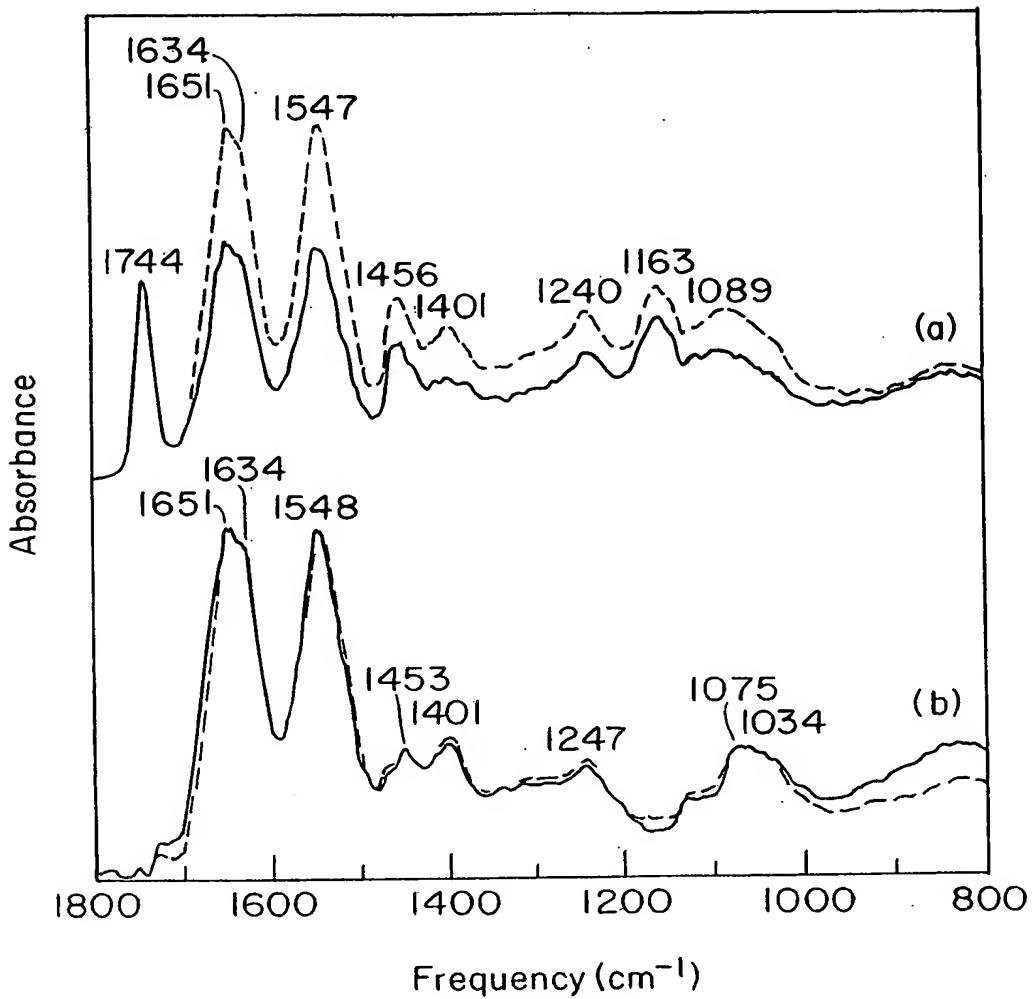


Fig. 10

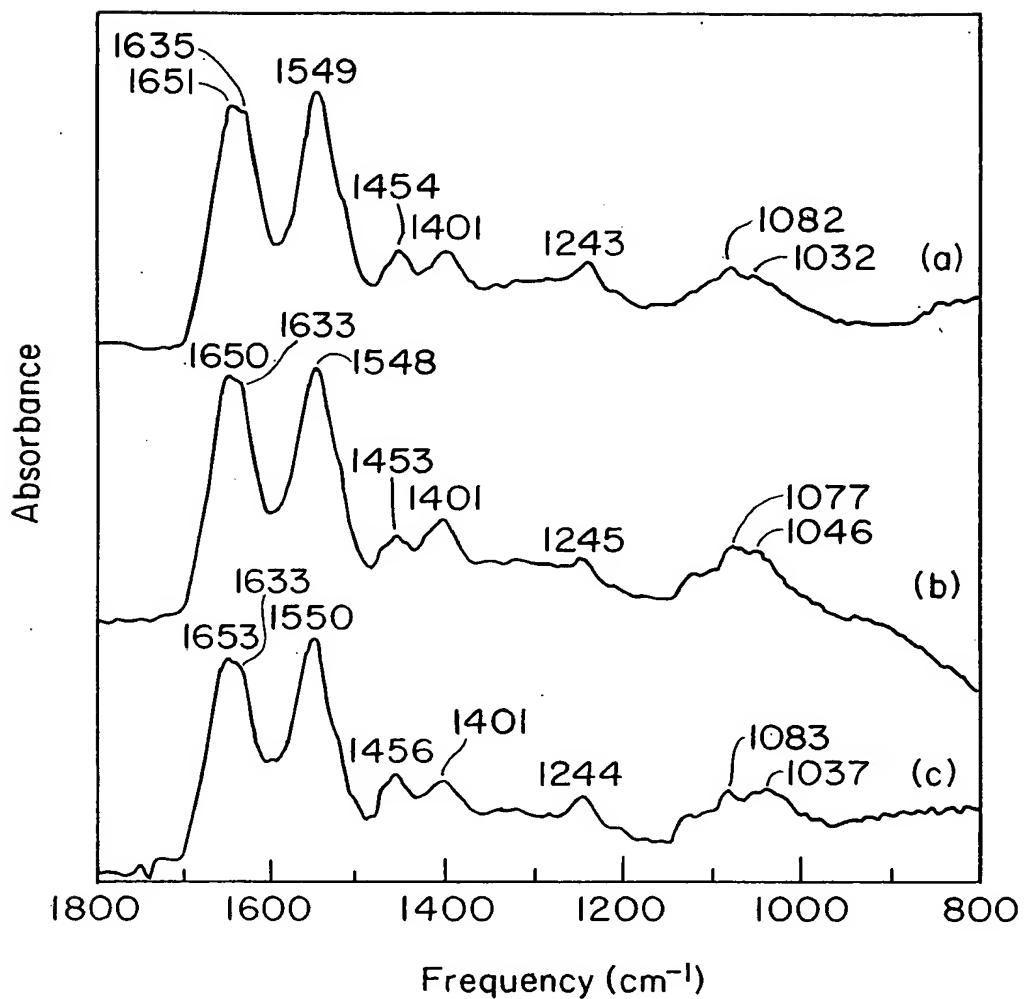


Fig. 11

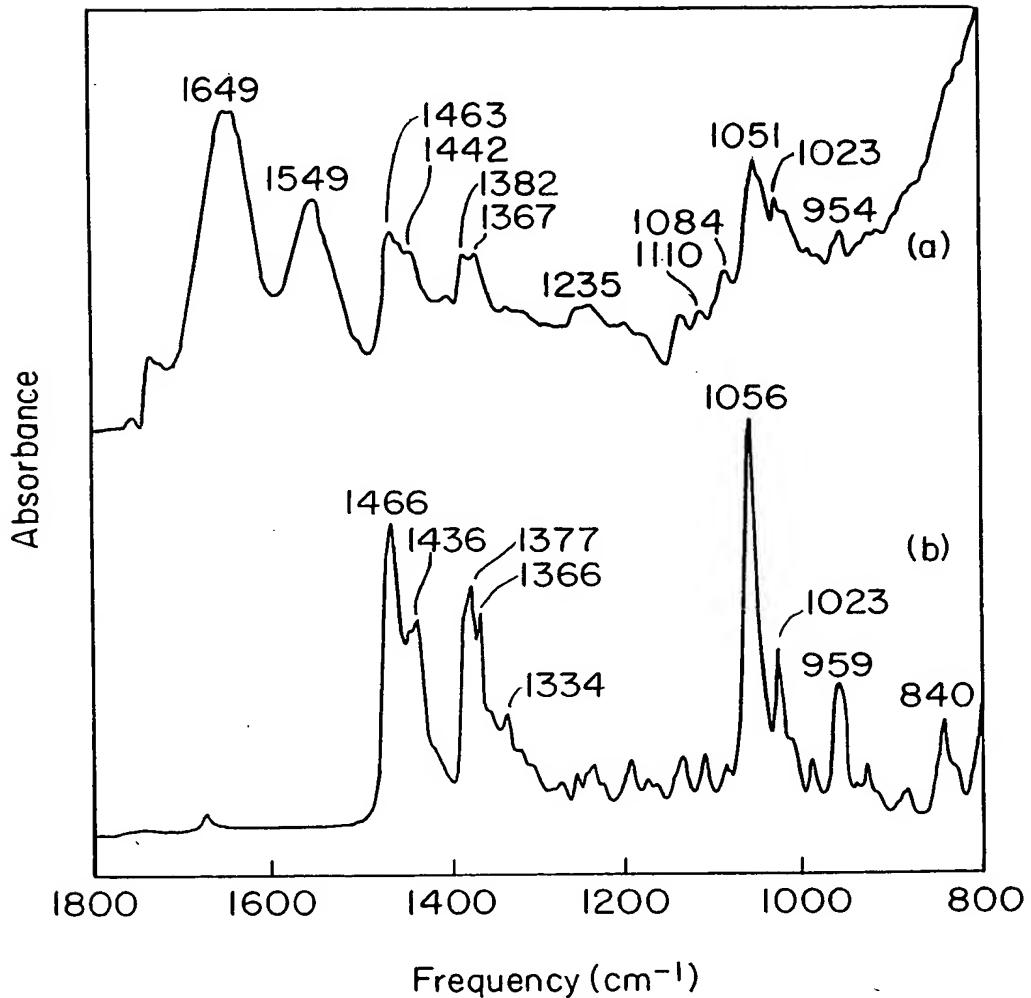


Fig. 12

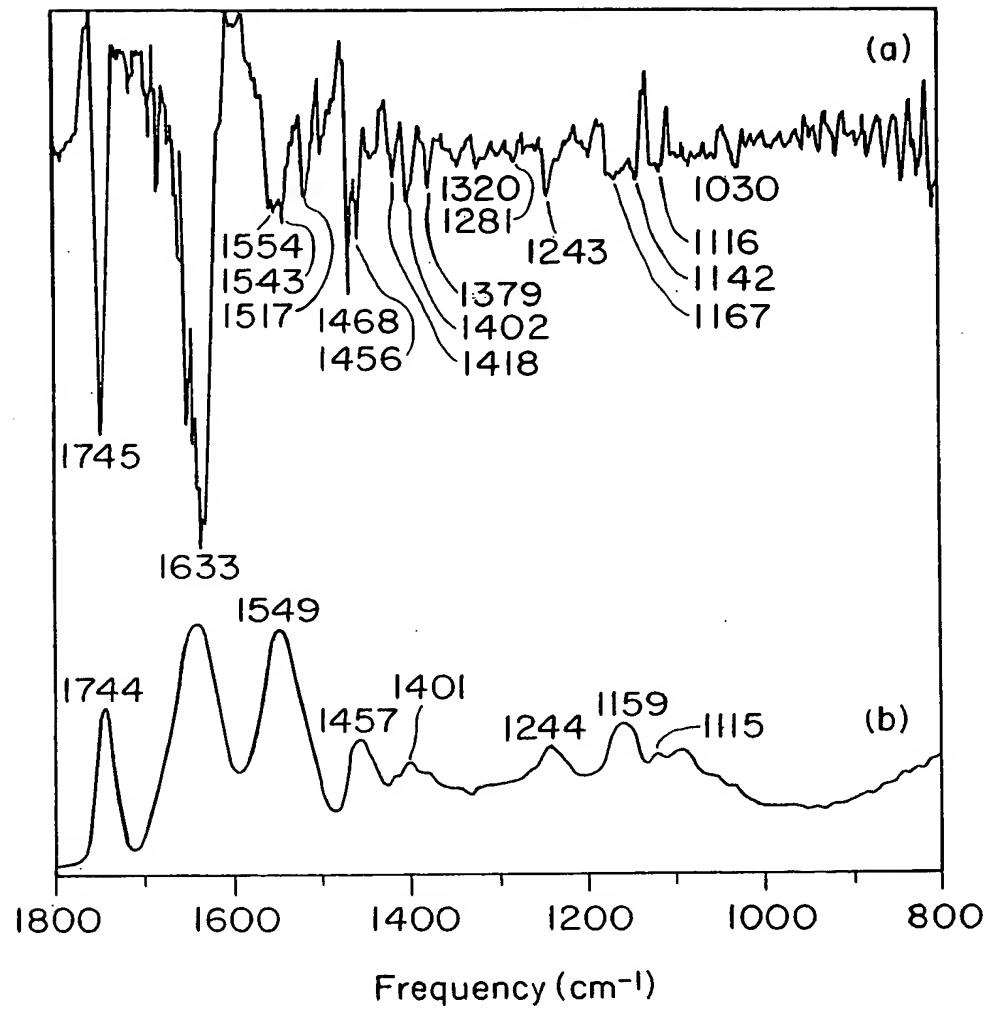


Fig. 14

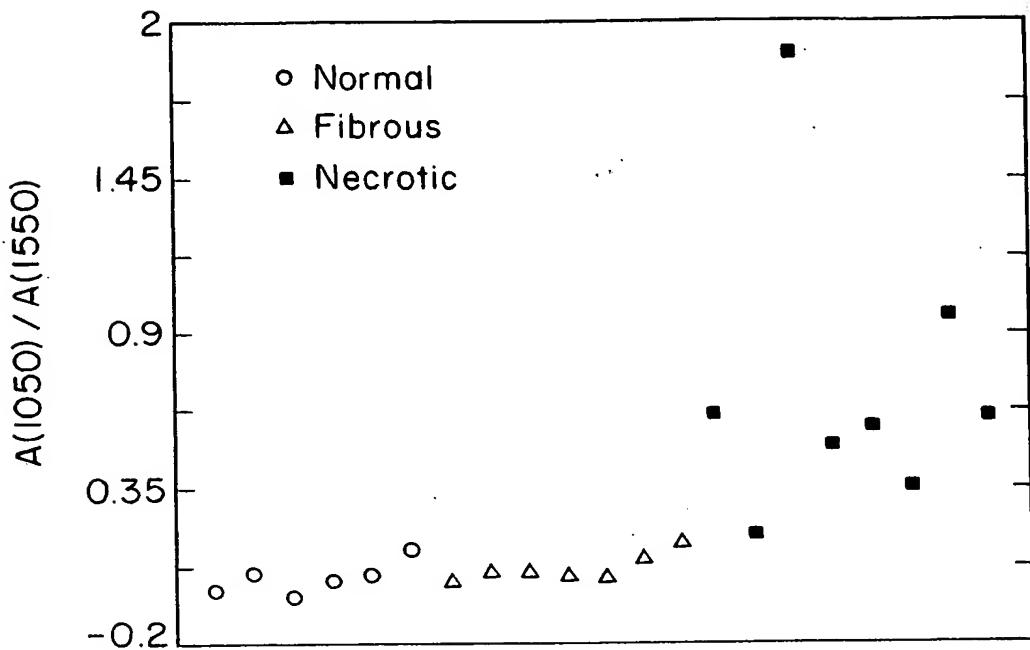


Fig. 13

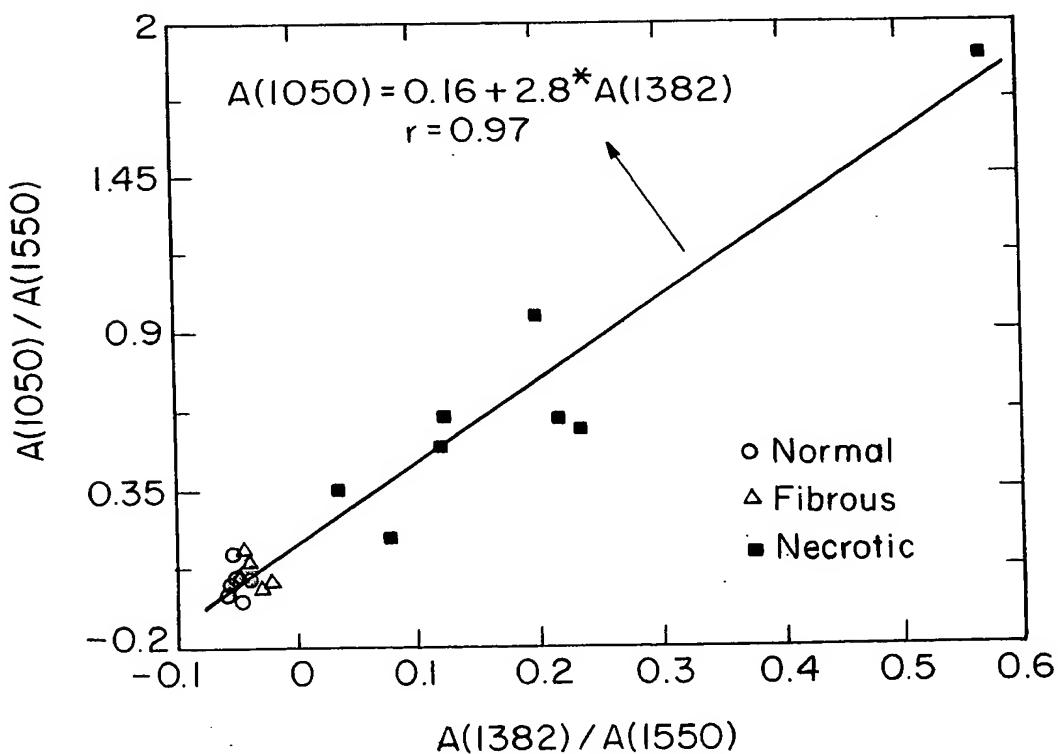
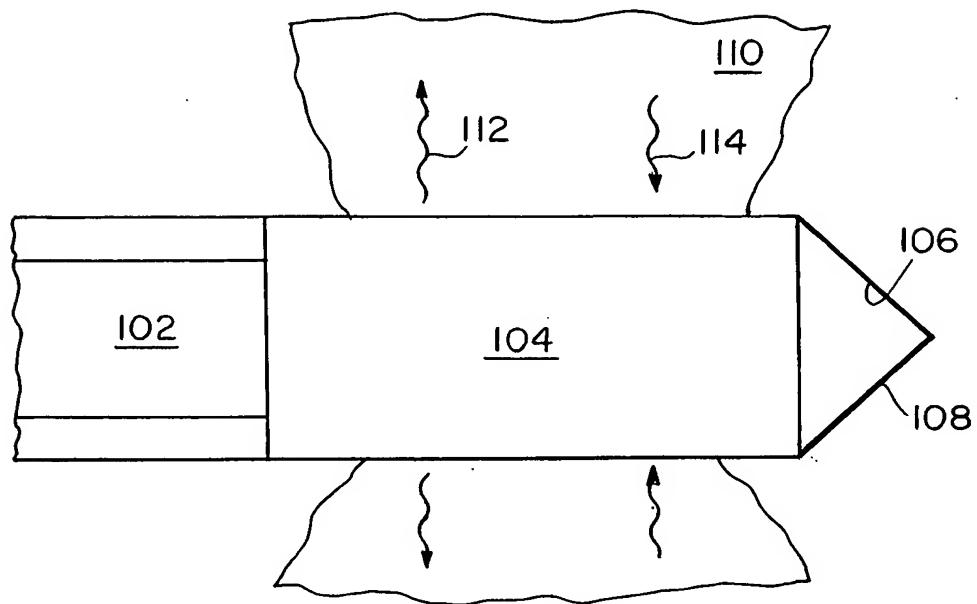
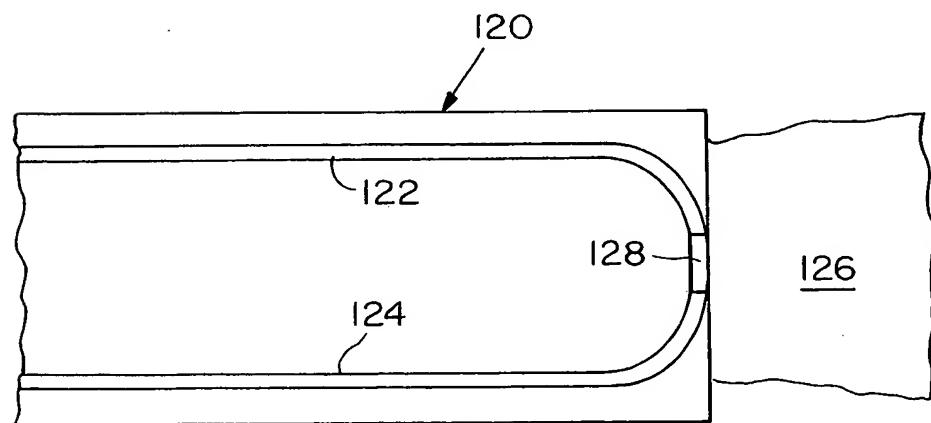


Fig. 15



*Fig. 16A*



*Fig. 16B*

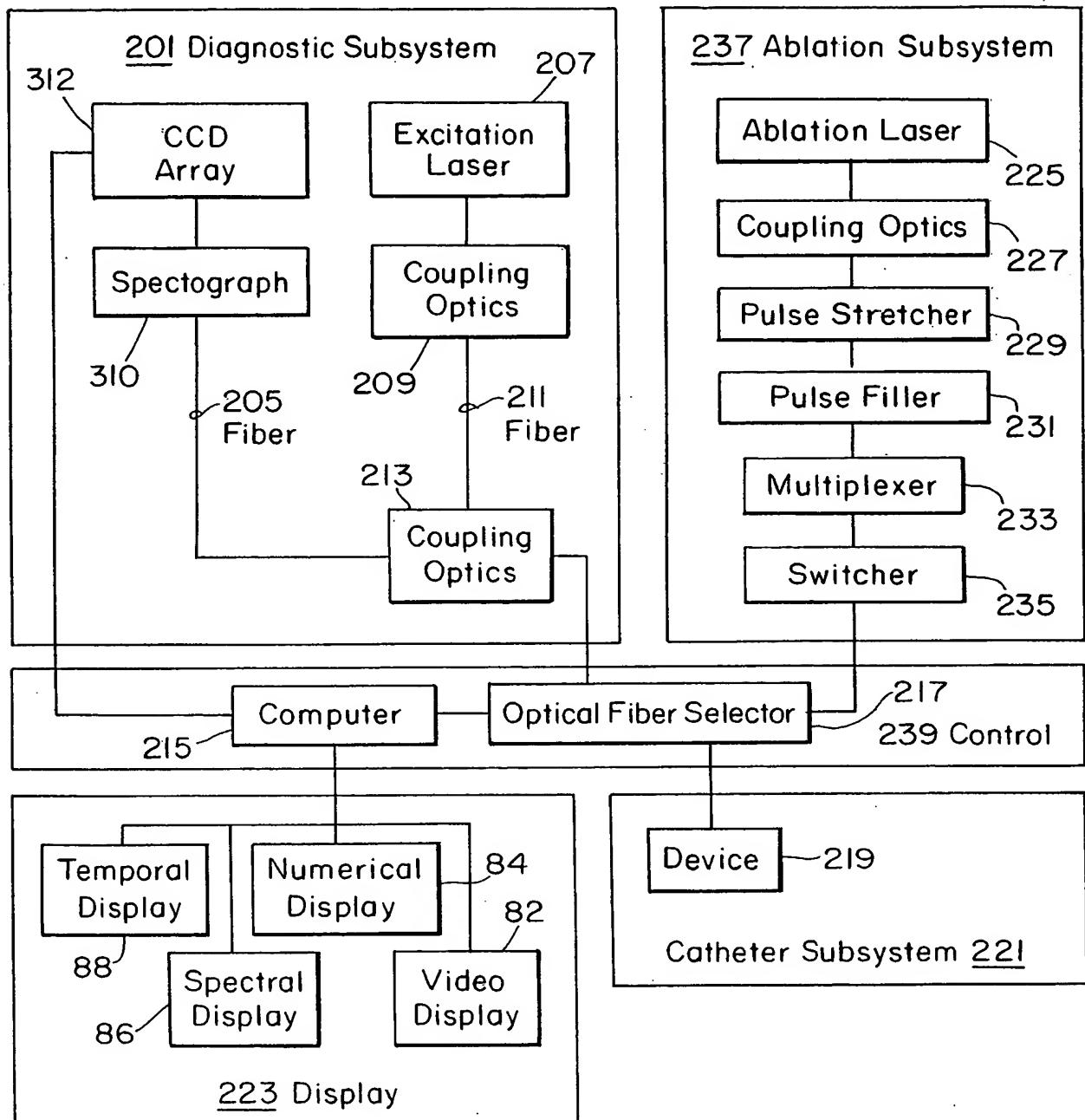


Fig. 17

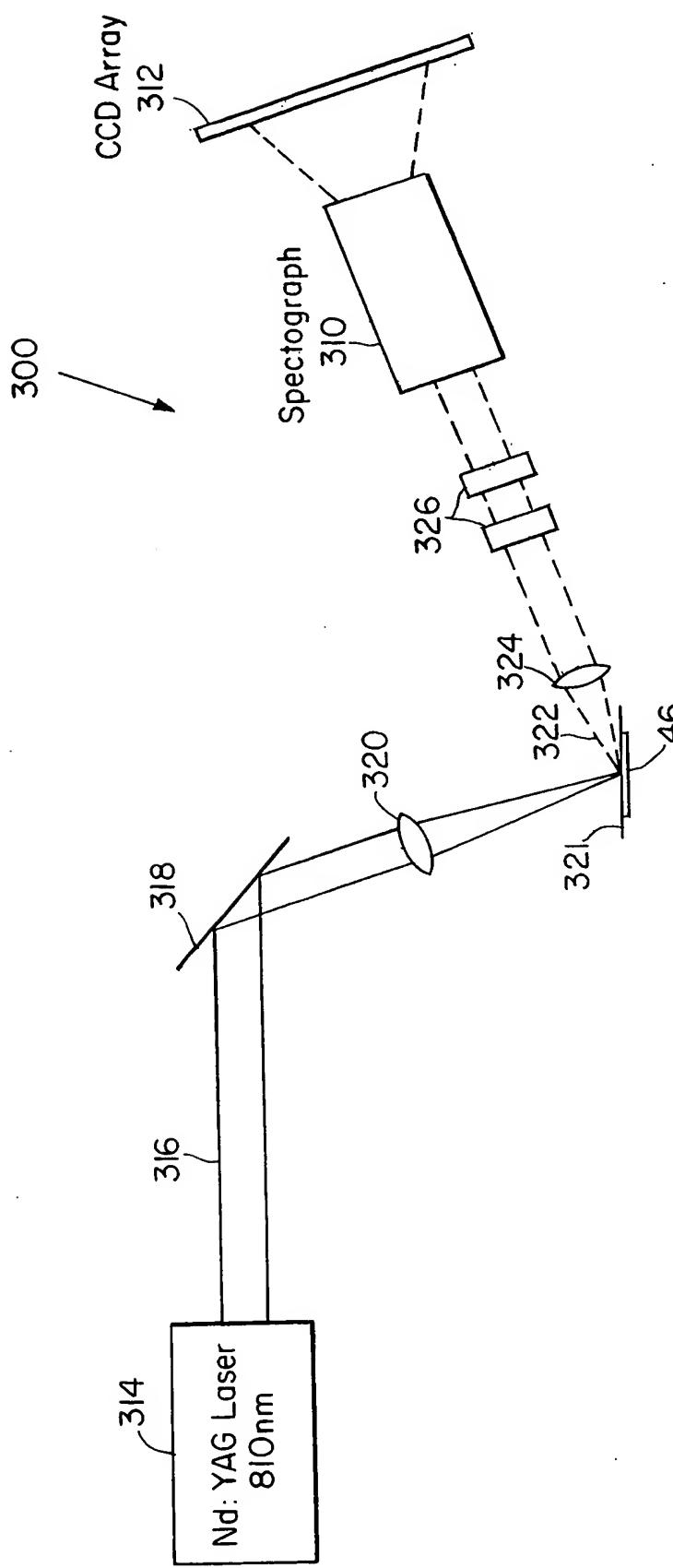


Fig. 18

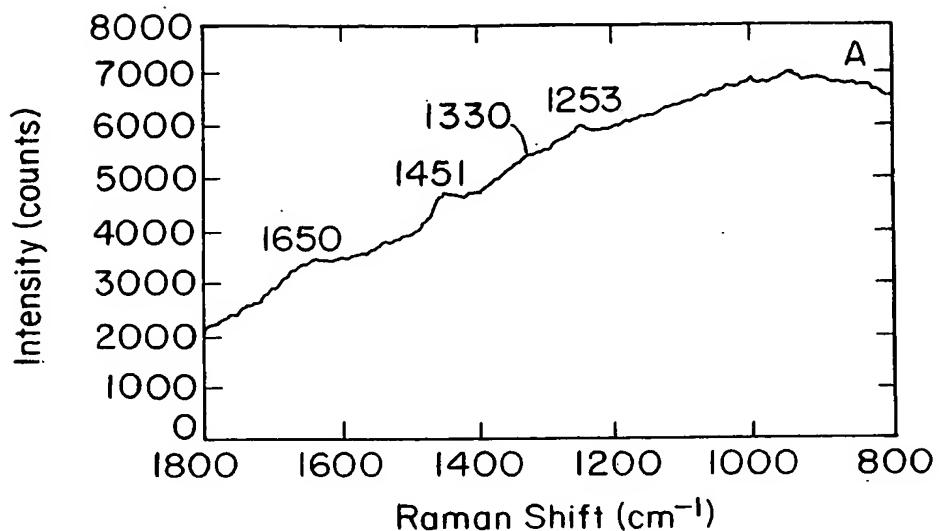


Fig. 19 (A)

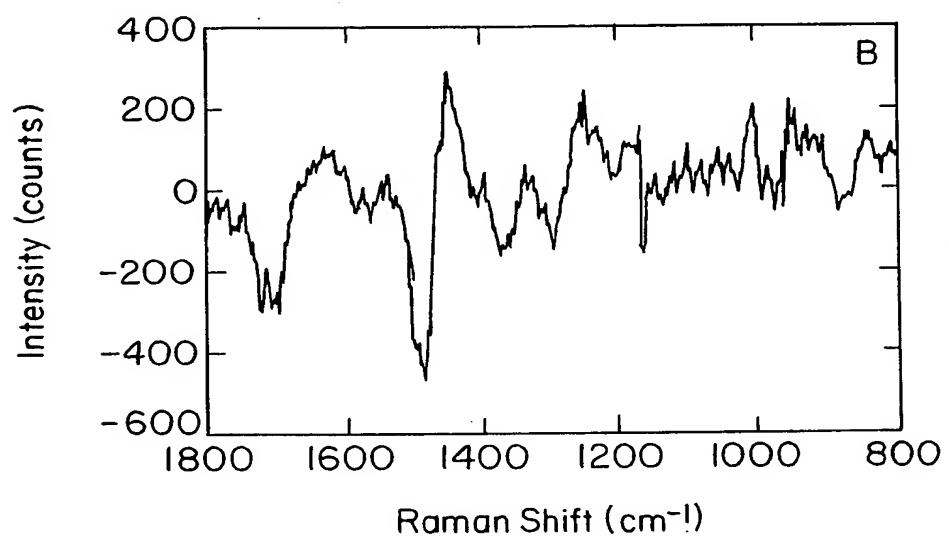


Fig. 19 (B)

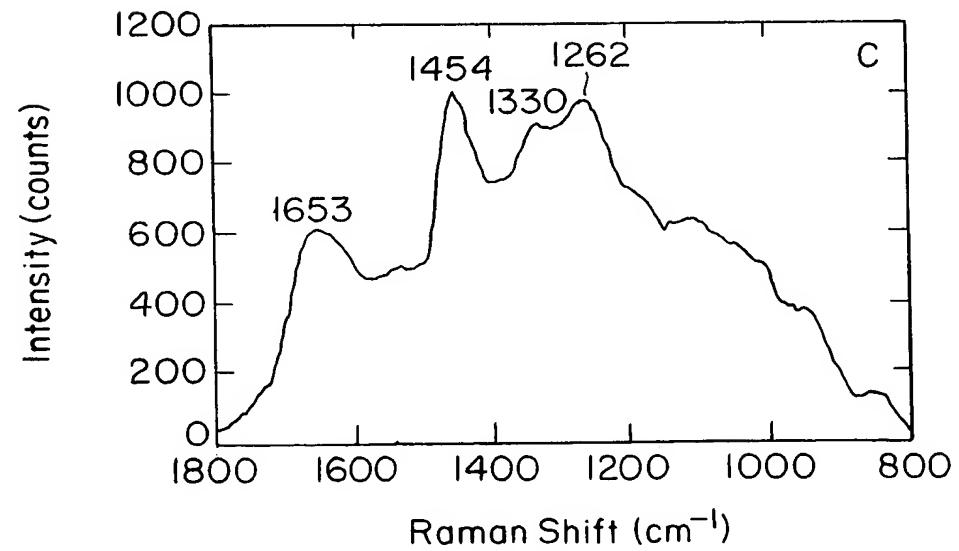


Fig. 19 (C)

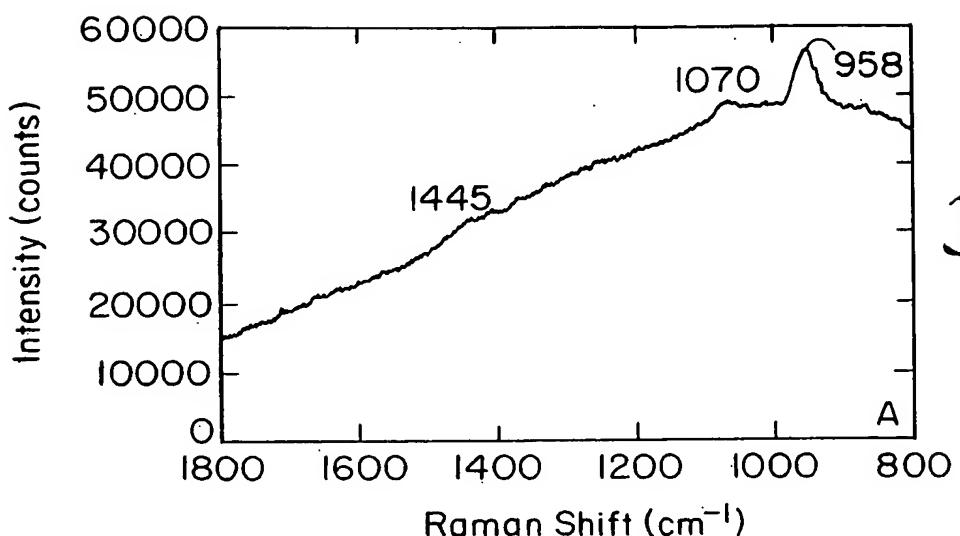


Fig. 20(A)

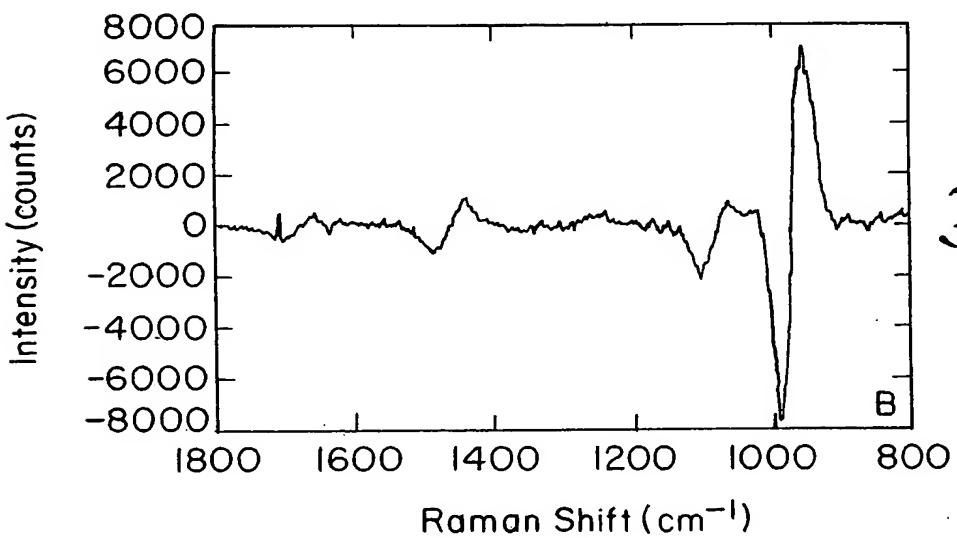


Fig. 20(B)

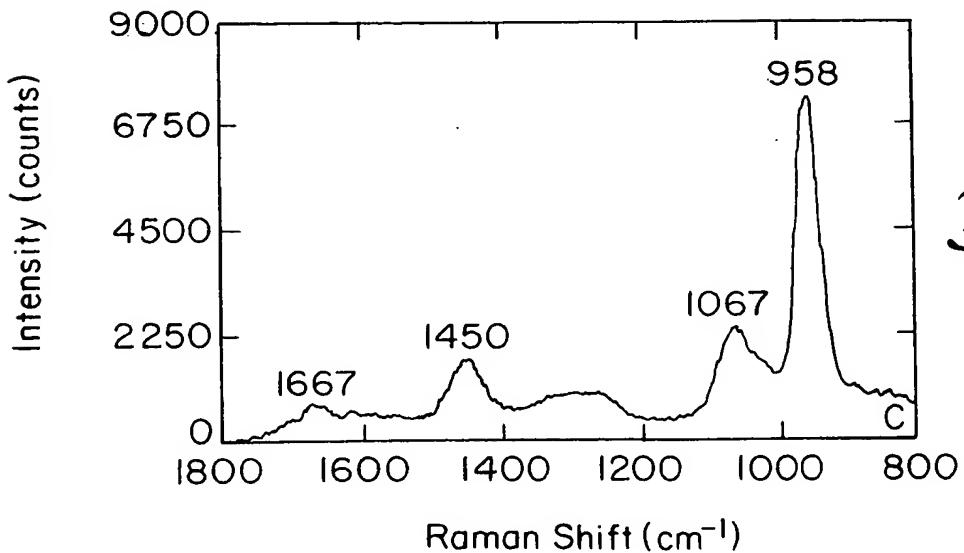


Fig. 20(C)

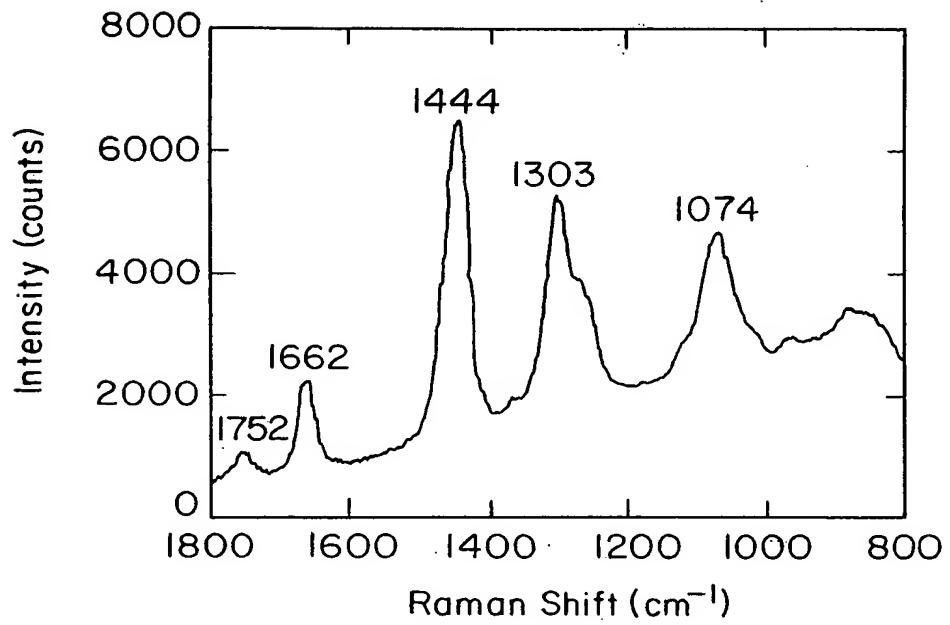


Fig. 21

**Table I. Preliminary assignments of IR absorption peaks in the ATR spectra of normal aorta intima.**

V (+1cm <sup>-1</sup> )	Preliminary Vibrational Assignment	Associated Tissue Components
2923(s)	C-H stretch	Lipid, Protein, Others
2853(s)	C-H stretch	Lipid, Protein, Others
1744(s)	C=O (ester) stretch	Lipid
1651(s)	Amide I	Protein
1635(sh)	Amide I, H-O-H bend	Protein, Water
1548(s)	Amide II	Protein
1465(s)	CH <sub>2</sub> bend	Lipid
1457(s)	CH <sub>2</sub> bend, CH <sub>3</sub> anti- symmetric deformation	Lipid
1454(m)	CH bend, CH <sub>3</sub> anti- symmetric deformation	Protein, others
1417(w)	CH <sub>2</sub> bend adjacent to C=O	Lipid
1401(m)	COO <sup>-</sup> symmetric stretch, amide C-N stretch	Protein, others
1378(w)	CH <sub>3</sub> symmetric deformation	Lipid
1244(m)	Amide III, PO <sub>2</sub> <sup>-</sup> anti- symmetric stretch	Protein, others
1239(m)	CH <sub>2</sub> wag, PO <sub>2</sub> <sup>-</sup> anti- symmetric stretch	Lipid
1159(s)	CH <sub>2</sub> wag, C-O-C antisymmetric stretch	Lipid
1117(w)	C-C stretch, O-C-O stretch	Lipid
1096(w)		Lipid
1083(w)	PO <sub>2</sub> <sup>-</sup> symmetric stretch	Protein, others
1030(w)		Lipid
965(w)	C=CH deformation (trans)	Lipid
722(m)	CH <sub>2</sub> rock	Lipid

Table II. Peak frequencies of selected bands in normal and atherosclerotic aorta.

Normal	Adventitia'	Fibrous Plaque	Fatty Plaque	Exposed Calcif.I	Exposed Calcif.II	Assignments
	1746w					C=O (ester) stretch
		1667m	1667m		1667m	C=C Stretch Lipid
1658s				1663m		Amide I (8)
	1655m					C=C stretch Fatty Acids
						Carotenoid (12)
1451s	1440s	1440s	1440s	1450s	1440s	C-H bend (8) Protein Lipid
	1301m	1301w	1301w		1300w	Lipid C-H bend
	1267w	1264w	1262w		1262w	(CH <sub>2</sub> ) Lipid C-H bend (=C-H)
1252m					1261w	Amide III (8)
						Carotenoid (12)
	1080m	1131w 1086w	1130w 1088w	1128w		C-C stretch Lipid

Table II. Continued

Normal	Adventitia*	Fibrous Plaque	Fatty Plaque	Exposed Calcif.I	Exposed Calcif.II	Assignments
				1071s	1071s	Phosphate antisymmetric stretch calcium salts (15)
1004w		1004w				Phenylalanine (8)
				960vs	960vs	Phosphate symmetric stretch calcium salts (15)
						Cholesterols (11)
				957w 882w 842w 803w 700m 606w 546w	959w 882w 841w 801w 700m 606w 546w	878w 850w 804w 699m 547w
					587m	Phosphate Calcium salts (15)

Peak frequencies of typical specimens, accurate to  $\pm 1 \text{ cm}^{-1}$ . Abbreviations: vs=very strong, s=strong, m=medium, and w=weak relative band intensity.  
 \*Adventitia specimen is mainly adipose tissue.